Chapter 30

Monitoring the SCB

You monitor and maintain the M40 router System Control Board (SCB), the control board for the Packet Forwarding Engine, to ensure that it provides route lookups, system component monitoring, exception and control packet transfer, and Flexible PIC Concentrator (FPC) operation and reset control. (See Table 92.)

Table 92: Checklist for Monitoring the SCB

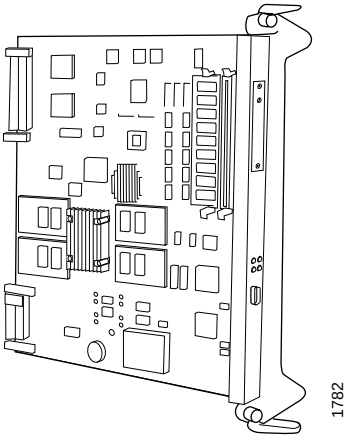
Monitor SCB Tasks	Command or Action
Understanding the SCB on page 394	
Monitoring the SCB Status on page 395	
1. Display the SCB Environmental Status on page 396	show chassis environment
2. Display the SCB Detailed Status on page 396	show chassis scb
3. Check the SCB LED Status on page 397	Check the LEDs on the SCB faceplate.
Checking for SCB Alarms on page 398	
1. Display SCB Error Messages in the System Log File on page 398	show log messages
2. Display SCB Error Messages in the Chassis Daemon Log File on page 399	show log chassisd
Verifying SCB Failure on page 400	
1. Check the SCB Connection on page 400	Ensure that the SCB is securely seated. Tighten the captive screws at the top and bottom of the SCB card carrier.
2. Perform an SCB Swap Test on page 400	Remove the failed SCB and replace it with one that you know works.
Getting SCB Hardware Information on page 401	
1. Display the SCB Hardware Information on page 401	show chassis hardware
2. Locate the SCB Serial Number ID Label on page 402	Look on the front of the SCB board near the faceplate.
3. Display the SCB Firmware Version on page 402	show chassis firmware
Returning the SCB on page 402	See “Return the Failed Component” on page 86, or follow the return procedure in the *M40 Internet Router Hardware Guide*.

Understanding the SCB

Purpose Inspect the SCB, the control board for the Packet Forwarding Engine, to ensure that it provides route lookups, system component monitoring, exception and control packet transfer, and FPC operation and reset control.

What Is the SCB The SCB is the control board for the M40 router Packet Forwarding Engine (see Figure 160).

Figure 160: SCB Component



The SCB performs four major functions:

Route lookups—The Internet Processor application-specific integrated circuit (ASIC) on the SCB performs route lookups using the forwarding table stored in synchronous SRAM (SSRAM). After performing the lookup, the Internet Processor informs the backplane of the forwarding decision, and the backplane forwards the decision to the appropriate outgoing interface.

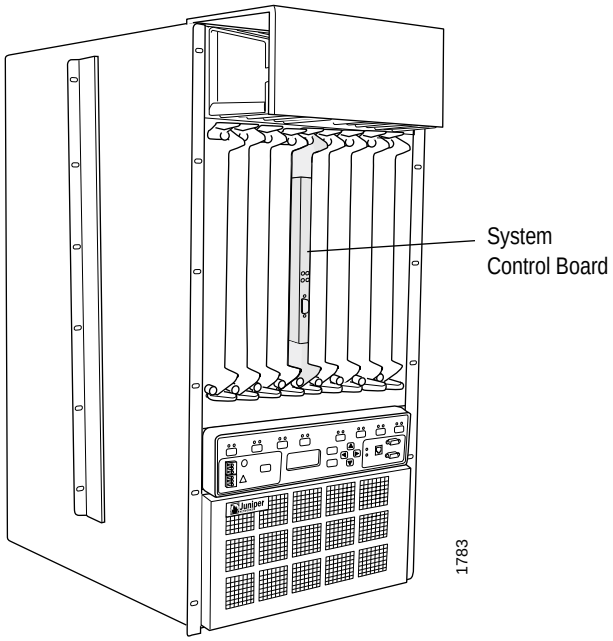
System component monitoring—The SCB monitors other system components for failure and alarm conditions. It collects statistics from all sensors in the system and relays them to the Routing Engine, which sets the appropriate alarm.

Exception and control packet transfer—The Internet Processor ASIC on the SCB passes exception packets to a microprocessor on the SCB, which processes almost all of them. The remaining packets are sent to the Routing Engine for further processing. Any errors originating in the Packet Forwarding Engine and detected by the SCB are sent to the Routing Engine using SYSLOG messages.

FPC reset control—The SCB monitors the operation of the FPCs. If it detects errors in an FPC, the SCB attempts to reset the FPC. After three unsuccessful resets, the SCB takes the FPC offline and informs the Routing Engine. Other FPCs are unaffected, and normal system operation continues.

The SCB occupies the center slot of the card cage, and is installed into the backplane from the front of the chassis (see Figure 161).

Figure 161: M40 Router SCB Location



The SCB is field-replaceable and hot-pluggable. You can remove and replace it without powering down the system; however, this causes major impact to the system. While the SCB is out of the router, route lookups, system component monitoring, exception and control packet transfer, and FPC operation and reset control cannot occur.

When you replace the SCB, it is rebooted by flash EEPROM.

Monitoring the SCB Status

If the SCB fails, no information about chassis components is available through the JUNOS software command-line interface (CLI).

Steps To Take To monitor the SCB status, follow these steps:

1. Display the SCB Environmental Status on page 396
2. Display the SCB Detailed Status on page 396
3. Check the SCB LED Status on page 397

Step 1: Display the SCB Environmental Status

Action To display the SCB environment status, use the following CLI command:

```
user@host> show chassis environment
```

Sample Output

```
user@host> show chassis environment
Class Item                Status     Measurement
Power Power Supply A      OK
      Power Supply B      Absent
Temp  FPC 0               OK         29 degrees C / 84 degrees F
      FPC 1               OK         25 degrees C / 77 degrees F
      FPC 5               OK         27 degrees C / 80 degrees F
      SCB                 OK         26 degrees C / 78 degrees F
[...Output truncated...]
```

What It Means The command output displays the SCB status and temperature. The SCB status can be OK, Failed, or Absent.

Step 2: Display the SCB Detailed Status

Action To display more detailed SCB status information, use the following CLI command:

```
user@host> show chassis scb
```

Sample Output

```
user@host> show chassis scb
SCB status:
  Temperature             27 degrees C / 80 degrees F
  CPU utilization          2 percent
  Interrupt utilization    0 percent
  Heap utilization        16 percent
  Buffer utilization      44 percent
  Total CPU DRAM          64 Mbytes
  Internet Processor II   Version 1, Foundry IBM, Part number 9
  Start time:             2001-12-07 08:59:04 PST
  Uptime:                 4 hours, 40 minutes, 28 seconds
```

What It Means The command output displays the temperature of the air passing by the SCB, in degrees Centigrade and Fahrenheit. It displays the total percentage of CPU being used by the SCB processor and the percentage being used for interrupts, the percentage of heap space and buffer space being used by the SCB processor, the total DRAM available to the SCB processor, the time when the SCB started running, and how long the SCB has been running. The Internet Processor version and part number are also displayed.

Step 3: Check the SCB LED Status

Action To check the SCB status, look at the LEDs on the SCB faceplate (see Figure 162).

Figure 162: SCB LEDs

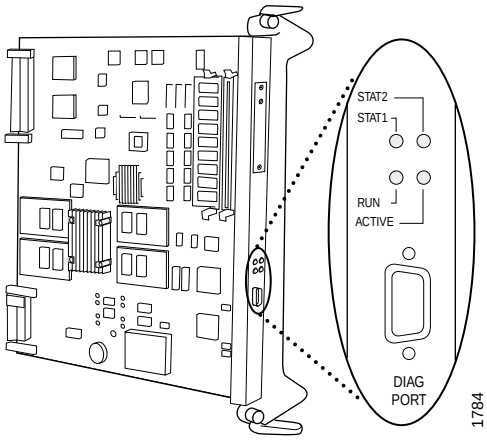


Table 93 describes the SCB LED states.

Table 93: SCB LEDs

Color	Label	State	Description
Green	ACTIVE	Flashing (pulsed with out-time proportional to traffic)	I/O interrupts are occurring.
Green	RUN	Blinking (slow and steady)	SCB processor is running. Normally, the blinking is faint and becomes bright only when the SCB is processing many exceptions.
Amber	STAT1	Flashing	Internal diagnostics are running.
Amber	STAT2	Flashing	Internal diagnostics are running.

If all four SCB LEDs are on, but dimly lit, the SCB is probably not seated properly. Tighten the captive screws at the top and bottom of the SCB card carrier.

If the green RUN LED on the SCB is not blinking, the SCB processor is not functioning normally. The SCB might not be connected properly to the backplane. Tighten the screws at the top and bottom of the SCB card carrier. If that does not work, reinstall the SCB.

The SCB has a reset switch on its faceplate above the LEDs. You normally do not use the reset switch. Pushing the reset switch results in a cold restart of the Packet Forwarding Engine, which causes a service interruption for a minute or two. To trip the reset switch, you must access it through a hole in the faceplate with a paper clip or other small probe.

Checking for SCB Alarms

Steps To Take To check for SCB alarms, follow these steps:

1. Display SCB Error Messages in the System Log File on page 398
2. Display SCB Error Messages in the Chassis Daemon Log File on page 399

Step 1: Display SCB Error Messages in the System Log File

An SCB failure can cause the fpx0 interface, the Ethernet connection to a management LAN, to go up and down.

Action To display SCB error messages in the system log file, use the following CLI command:

```
user@host> show log messages
```

Sample Output

```
user@host> show log messages
Nov 19 04:35:29 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:29 host rpd[355]: task_connect: task BGP_209.192.168.0.21+179 addr 192.168.0.21+179: No route to
host
Nov 19 04:35:29 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:29 host rpd[355]: bgp_connect_start: connect 192.168.0.21 (Internal AS 209): No route to host
Nov 19 04:35:29 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:29 host last message repeated 9 times
Nov 19 04:35:29 host tnp.bootpd[369]: BOOTPD_BOOTSTRING: boot 1 scb.jbf
Nov 19 04:35:29 host tnp.tftpd[389]: TFTPD_INFO: tftp read from addr 2 po
rt 1024 file scb.jbf
Nov 19 04:35:31 host tnp.tftpd[389]: TFTPD_INFO: sent 1348 blocks of 1024 and 1 block of 780 for file
/usr/share/pfe/scb.jbf
Nov 19 04:35:32 host mgd[387]: UI_CMDLINE_READ_LINE: user 'user', command 'show chassis scb '
Nov 19 04:35:34 host /kernel: fxp1: link media DOWN 10Mb / half-duplex
Nov 19 04:35:34 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:34 host rpd[355]: EVENT <UpDown> fxp1.0 index 1 <Broadcast Multicast> address #0 0.80.82.18.14.83
Nov 19 04:35:34 host mib2d[354]: SNMP_TRAP_LINK_DOWN: ifIndex 2, ifAdminStatus up(1), ifOperStatus
down(2), ifName fxp1
Nov 19 04:35:34 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:34 host last message repeated 4 times
Nov 19 04:35:35 host /kernel: fxp1: media DOWN 100Mb / half-duplex
Nov 19 04:35:36 host /kernel: fxp1: link UP 100Mb / half-duplex
Nov 19 04:35:36 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:36 host rpd[355]: EVENT <UpDown> fxp1.0 index 1 <Up Broadcast Multicast> address #0
0.80.82.18.14.83
Nov 19 04:35:36 host mib2d[354]: SNMP_TRAP_LINK_UP: ifIndex 2, ifAdminStatus up(1), ifOperStatus up(1),
ifName fxp1
Nov 19 04:35:36 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:36 host last message repeated 4 times
Nov 19 04:35:37 host /kernel: fxp1: link media DOWN 10Mb / half-duplex
Nov 19 04:35:37 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:37 host rpd[355]: EVENT <UpDown> fxp1.0 index 1 <Broadcast multicast> address #0 0.80.82.18.14.83
Nov 19 04:35:37 host mib2d[354]: SNMP_TRAP_LINK_DOWN: ifIndex 2, ifAdminStatus up(1), ifOperStatus
down(2), ifName fxp1
Nov 19 04:35:37 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
Nov 19 04:35:37 host last message repeated 4 times
Nov 19 04:35:38 host /kernel: fxp1: media DOWN 100Mb / full-duplex
Nov 19 04:35:38 host /kernel: fxp1: link UP 100Mb / full-duplex
Nov 19 04:35:38 host snmpd[353]: SNMPD_SEND_FAILURE: trap_io_send_trap_now: sendto: No route to host
```

What It Means The messages system log file records the time the failure or event occurred, the severity level, a code, and a message description. When the SCB fails, the fxp1 interface keeps going up and down. You can use the show log messages | match scb command to see error messages that are generated when an SCB fails or is offline. Use this information to diagnose a problem and to let the Juniper Networks Technical Assistance Center (JTAC) know what error messages were generated and the router events that occurred before and after the problem. For more information about system log messages, see the *JUNOS System Log Messages Reference*.

Step 2: Display SCB Error Messages in the Chassis Daemon Log File

Action To display SCB error messages in the chassis daemon (chassisd) log file, use the following CLI command:

```
user@host> show log chassisd
```

Sample Output

```
user@host> show log chassisd
Nov 19 04:09:02 closing alarmd connection.
Nov 19 04:09:02 closing craftd connection.
Nov 19 04:09:02 rcv: chassisd_ipc_dispatch() null ipc_pipe_read, closing connect
ion
Nov 19 04:09:02 alarmd connection completed
Nov 19 04:09:02 craftd connection completed
Nov 19 04:09:30 rcv reply: SCB Restart
Nov 19 04:09:30 send: scb config cmd
Nov 19 04:09:30 send: display hostname <ewr-edge-03>, uptime 16182073 seconds
Nov 19 04:09:30 send: password = nnection.
Nov 19 04:09:30 send: display unlockction.
Nov 19 04:09:30 send: clear all chassis class alarmsc_pipe_read, closing connect
Nov 19 04:09:30 send: set boolean type 0 slot 0 which 1 off
Nov 19 04:09:30 rcv reply: Backplane MAC addrs recieved
Nov 19 04:09:30 rcv reply: Backplane SRAM size 8388608 banks[ 1 1 1 1 ]
Nov 19 04:09:30 jtree init (2097152 4)
Nov 19 04:09:35 repead pid 15567, status 0
Nov 19 04:09:41 rcv reply: chassis info
Nov 19 04:09:49 CHASSISD_EVENT: slot 0 restart
Nov 19 04:09:50 pic online req, pic 0 type 515, fpc 0
Nov 19 04:09:50 send: fpc 0 pic 0 online ack
Nov 19 04:09:51 CHASSISD_EVENT: slot 0 attach
Nov 19 04:09:51 rcv reply: PIC attach fpc 0 pic 0 type 515 version 260
Nov 19 04:09:52 CHASSISD_EVENT: slot 1 restart
Nov 19 04:09:53 pic online req, pic 0 type 515, fpc 1
Nov 19 04:09:53 send: fpc 1 pic 0 online ack
Nov 19 04:09:54 CHASSISD_EVENT: slot 2 restart
Nov 19 04:09:55 pic online req, pic 0 type 518, fpc 2
Nov 19 04:09:55 send: fpc 2 pic 0 online ack
Nov 19 04:09:55 pic online req, pic 1 type 518, fpc 2
Nov 19 04:09:55 send: fpc 2 pic 1 online ack
Nov 19 04:09:55 pic online req, pic 2 type 518, fpc 2  515 version 260
Nov 19 04:09:55 send: fpc 2 pic 2 online ackrt
Nov 19 04:09:57 CHASSISD_EVENT: slot 3 restart, fpc 1
Nov 19 04:09:58 CHASSISD_EVENT: slot 4 restart
Nov 19 04:09:58 CHASSISD_EVENT: slot 1 attach
Nov 19 04:09:59 pic online req, pic 0 type 518, fpc 4
```

What It Means The chassisd database provides the date, time, and a component status message. The chassisd database is dynamic. It is initialized at router startup and is updated when components are added or removed. You can search for multiple items in the chassisd log file by using the | match “item | item | item” command. For example, | match “scb | kernel | tnp” is a search for error messages for the SCB, kernel, and Trivial Networking Protocol (TNP), and indicates communication issues between the Routing Engine and the Packet Forwarding Engine components.

Verifying SCB Failure

Steps To Take To verify SCB failure, follow these steps:

1. Check the SCB Connection on page 400
2. Perform an SCB Swap Test on page 400

Step 1: Check the SCB Connection

If the SCB is not seated properly, it will not function.

Action To check the SCB connection, make sure that the SCB is properly seated in the slot. Tighten the captive screws at the top and bottom of the SCB card carrier.

Step 2: Perform an SCB Swap Test

CAUTION: Before performing a swap test, always check for bent pins in the midplane and check the SCB for stuck pins in the connector. Pins stuck in the component connector can damage other good slots during a swap test.

Action To perform a swap test on an SCB, follow these steps:

1. Attach an electrostatic discharge (ESD) wrist strap to your bare wrist, and connect the wrist strap to one of the two ESD points on the chassis.
2. Unscrew the thumbscrews at the top and bottom of the card carrier.
3. Flip the ends of the two extractor clips, which are adjacent to the thumbscrews, away from each other to unseat the SCB from the backplane.
4. Grasp both sides of the card carrier and slide the SCB about three-quarters of the way out of the router.
5. Move one of your hands underneath the SCB to support it, and slide it completely out of the chassis.
6. Replace the SCB with one that you know works.
7. Grasp the front of the SCB card carrier with both hands and align the back of the working SCB card carrier with the slide guides on the chassis.
8. Slide the SCB card carrier all the way into the card cage until it contacts the backplane.

9. Flip the extractor clips, located on the top and bottom of the card carrier, towards each other to lodge the SCB in place.

10. Tighten the thumbscrews on the card carrier to seat the SCB.

NOTE: To seat the SCB properly, be sure to tighten the screws securely. If the SCB is not seated properly, it will not function.

Getting SCB Hardware Information

Steps To Take To obtain SCB hardware information, follow these steps:

1. Display the SCB Hardware Information on page 401
2. Locate the SCB Serial Number ID Label on page 402
3. Display the SCB Firmware Version on page 402

Step 1: Display the SCB Hardware Information

Action To display the SCB hardware information, use the following CLI command:

```
user@host> show chassis hardware
```

Sample Output

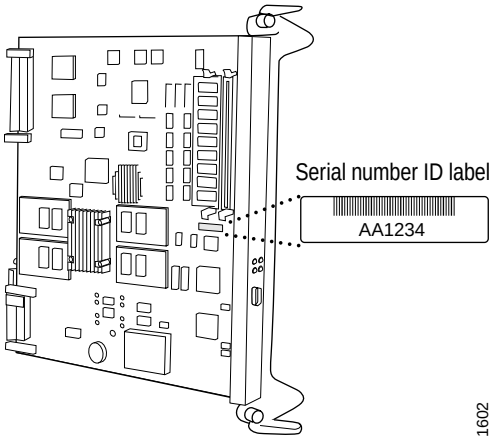
```
user@host> show chassis hardware
Hardware inventory:
Item            Version  Part number  Serial number     Description
Chassis                                 00291            M40
Backplane       REV 10   710-000073   AA2220
Power Supply A  Rev A1   740-000234   000134           AC
Maxicab         REV 07   710-000229   AA6957
Minicab         REV 03   710-000482   AA3324
Display         REV 07   710-000150   AA7798
Routing Engine                                        RE-1.0
SCB             REV 11   710-000075   AA7244           Internet Processor I
[...Output truncated...]
```

What It Means The command output displays the SCB version level, part number, serial number, and description.

Step 2: Locate the SCB Serial Number ID Label

Action To locate the SCB serial number ID label, look on the SCB board toward the front panel.

Figure 163: SSB Serial Number ID Label



Step 3: Display the SCB Firmware Version

Action To display the version of firmware running on the SCB, use the following CLI command:

```
user@host> show chassis firmware
```

Sample Output

```
user@host> show chassis firmware
Part                Type      Version
[...Output truncated...]
SCB 0               ROM       Juniper ROM Monitor Version 3.0b1
                    O/S       Version 5.5-20020613-cqPqI7 by builder on 2
```

What It Means The command output displays the type and version level of the firmware running on the SCB.

Returning the SCB

The SCB is field-replaceable and hot-pluggable. You can remove and replace it without powering down the system; however this causes major impact to the system. While the SCB is out of the router, route lookups, system component monitoring, exception and control packet transfer, and FPC operation monitoring cannot occur.

Action To return the SCB, see “Return the Failed Component” on page 86, or the return procedure in the *M40 Internet R outer Hardware Guide*.